



Weston Solutions, Inc.
750 East Bunker Court, Suite 500
Vernon Hills, IL 60061-1865
847-918-4000 • Fax 847-918-4055
www.westonsolutions.com

January 31, 2013

Mr. Paul Ruesch
Federal On-Scene Coordinator
U.S. Environmental Protection Agency
Region 5 Emergency Response Branch
77 West Jackson Boulevard
Chicago, IL 60604

**Subject: Midwest Generation – Crawford Station Site and
Midwest Generation – Fisk Station Site
Chicago, Cook County, Illinois
Technical Direction Documents No.: S05-0001-1210-016 and S05-0001-1210-018
Document Control No.: 2014-2A-BBWE
Work Orders No.: 20405.012.001.2014.00 and 20405.012.001.2016.00**

Dear Mr. Ruesch:

Under Technical Direction Documents No. (TDD) S05-0001-1210-016 and S05-0001-1210-018, the United States Environmental Protection Agency (U.S. EPA) tasked the Weston Solutions, Inc. (WESTON®), Superfund Technical Assessment and Response Team (START) to conduct perimeter particulate air monitoring and off-site gamma radiation screening support at the Midwest Generation - Crawford Station Site and Midwest Generation - Fisk Station Site in Chicago, Cook County, Illinois (the Sites). On September 18, 2012, the Chicago Legal Clinic, Inc., legal counsel on behalf of the Pilsen Environmental Rights and Reform Organization (PERRO) and the Little Village Environmental Justice Organization (LVEJO), contacted the U.S. EPA regarding concerns about environmental impacts from the Sites. In response to correspondence with PERRO and LVEJO, the U.S. EPA developed a conceptual plan to conduct perimeter particulate air monitoring and off-site gamma radiation screening activities to address public ambient air concerns associated with the Sites. On October 22, 2012, the U.S. EPA requested perimeter particulate air monitoring and off-site gamma radiation screening support from WESTON START. The objectives of the Site activities were to document current Site conditions, conduct perimeter particulate air monitoring, conduct off-site gamma radiation screening, and report the results.

The scope of the TDDs included the following:

- Generate a health and safety plan and an off-site work plan for perimeter particulate air monitoring and gamma radiation screening
- Conduct particulate air monitoring
- Generate a final letter report



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Crawford and Fisk Station Sites
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This letter report discusses the Site description, perimeter particulate air monitoring and off-site gamma radiation screening activities, perimeter particulate air monitoring and off-site gamma radiation screening results, and summarizes the perimeter particulate air monitoring and gamma radiation screening activities.

SITE DESCRIPTION

The Sites are owned by Midwest Generation, LLC. Midwest Generation purchased both Sites from Commonwealth Edison Company (ComEd) in December 1999. In early 2012, Midwest Generation announced plans to close the two on-site plants. The Crawford Station and Fisk Station Sites are described below.

Crawford Station Site

The Site is located at 3501 South Pulaski Road in Chicago, Cook County, Illinois. **Figure A-1a** in **Attachment A** shows the Crawford Station Site location. The Site's coordinates are 41°49'42.78" North latitude and 87°43'19.29" West longitude. The Site is bordered to the north by West Cougar Street, with railroad tracks and West 33rd Street beyond; to the east by South Hamlin Avenue, with commercial and industrial properties beyond; to the south by the Chicago Sanitary and Ship Canal, with industrial properties beyond; and to the west by South Pulaski Road, with commercial and industrial properties beyond. **Figure A-2a** in **Attachment A** shows the Crawford Station Site features and surrounding commercial and industrial properties.

The Site occupies 72 acres and is developed with buildings and infrastructure associated with Midwest Generation's Crawford Station coal-fired electric power generating plant. Residential properties are located approximately 105 feet north and 2,000 feet southeast of the Site.

Fisk Station Site

The Site is located at 1111 West Cermak Road in Chicago, Cook County, Illinois. **Figure A-1b** in **Attachment A** shows the Fisk Station Site location. The Site's coordinates are 41°51'08.62" North latitude and 87°39'08.95" West longitude. The Site is bordered to the north by railroad tracks, with West Cermak Road and commercial properties beyond; to the east by commercial and industrial properties; to the south by the South Branch of the Chicago River, with industrial properties beyond; and to the west by commercial properties, with South Throop Street beyond. **Figure A-2b** in **Attachment A** shows the Fisk Station Site features and surrounding commercial and industrial properties.

The Site occupies 60 acres and is developed with buildings and infrastructure associated with Midwest Generation's Fisk Station coal-fired electric power generating plant. Residential properties are located approximately 700 feet south and 800 feet north of the Site.



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Crawford and Fisk Station Sites
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PERIMETER PARTICULATE AIR MONITORING AND GAMMA RADIATION SCREENING ACTIVITIES

From October 22, 2012 to November 20, 2012 WESTON START personnel provided technical support in the development of a conceptual plan outline, Site maps, a summary of the proposed approach to support meetings with community groups, and an equipment list for the Site activities. In addition, WESTON START personnel prepared meetings notes from and supported conference calls and meetings with participating agencies and U.S. EPA field personnel involved in the Work Plan. WESTON START personnel provided a complete Work Plan to U.S. EPA on November 20, 2012.

A chronological discussion of perimeter particulate air monitoring and gamma radiation screening at the Crawford Station and Fisk Station Sites is presented below. **Appendix B** provides a photographic log documenting Site conditions and monitoring activities.

November 26, 2012

U.S. EPA On-Scene Coordinator (OSC) Paul Ruesch and WESTON START conducted initial reconnaissance and particulate air monitoring coordination activities at the Crawford Station and Fisk Station Sites. Air monitoring locations were identified at the Site perimeters to provide representative data in each direction. OSC Ruesch coordinated with the Midwest Generation officials to acquire access to both Sites. SCRIBE, SCRIBE.NET, Response Manager, and ArcGIS products were used throughout each day to post data to a Flex Viewer site. The Flex Viewer Site was accessible through an internet connection and allowed viewing of real-time and geographically current datasets during Site activities. SCRIBE and Response Manager were configured to support the data quality objectives, and the Flex Viewer Site was configured to show the data streams selected by the U.S. EPA.

December 3, 2012

U.S. EPA and WESTON START personnel returned to the Crawford Station Site to conduct further site reconnaissance and particulate air monitoring activities on a windy day. **Table C-1** in **Attachment C** summarizes Pasquill-Gifford Stability Index, which was used as a reference as defined in the Work Plan, for windy conditions (Classes A, B, and C) and non-windy conditions (Classes D, E, and F). On-site work activities included stack demolition in the central area of the Site, resulting in no visible dust. Off-site activities noted in the surrounding area included semi-truck traffic on West Cougar Street to the north, creating visible dust; active industrial and commercial properties to the east; asphalt production activities and the I-55 corridor beyond the Chicago Sanitary and Ship Canal to the south; concrete-crushing operations to the southwest; and heavy traffic on South Pulaski Road to the west. Perimeter particulate air monitoring was conducted using four stationary Dataram 4 units (Dataram) and one mobile Dataram.



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Crawford and Fisk Station Sites
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Figure A-2a in **Attachment A** shows the four stationary air monitoring locations at the Crawford Station Site. The stationary Datarams were attached to tripods approximately 4 feet above the ground surface. At the stationary air monitoring locations, continuous, real-time particulate monitoring data were logged using the wireless sensor communication system software VIPER Survey Controller (VIPER) over an approximate 8-hour time period. An Oregon Scientific WMR200A weather station was set up on the west end of the Site (**Figure A-2a**) to track weather conditions during air monitoring activities.

Figure A-3a in **Attachment A** shows the mobile Dataram air monitoring locations at Crawford Station Site. The mobile Dataram was combined with a global positioning system (GPS) unit using the real-time data collection software Field Analysis & Sampling Tool (FAST). Three rounds of FAST perimeter monitoring were conducted throughout the day.

December 4, 2012

U.S. EPA and WESTON START personnel returned to the Fisk Station Site to conduct further site reconnaissance and particulate air monitoring activities on a windy day. **Table C-1** in **Attachment C** summarizes Pasquill-Gifford Stability Index, which was used as a reference for windy conditions (Classes A, B, and C) and non-windy conditions (Classes D, E, and F). On-site work activities included concrete saw-cutting and trenching in the north end of the Site and pipe repair activities on the south end of the Site, resulting in visible dust. Off-site activities noted in the surrounding area included heavy traffic on West Cermak Road and occasional rail activity to the north, concrete production and construction debris stockpiling activities to the east, and industrial construction yard activities beyond the South Branch of the Chicago River to the south. Perimeter particulate air monitoring was conducted using four stationary Datarams and one mobile Dataram.

Figure A-2b in **Attachment A** shows the four stationary air monitoring locations at the Fisk Station Site. The stationary Datarams were attached to tripods approximately 4 feet above the ground surface. At the stationary air monitoring locations, continuous, real-time particulate monitoring data were logged using the wireless sensor communication system software VIPER over an approximate 8-hour time period. An Oregon Scientific WMR200A weather station was set up on the east end of the Site (**Figure A-2b**) to track weather conditions during air monitoring activities.

Figure A-3b in **Attachment A** shows the mobile Dataram air monitoring locations at the Fisk Station Site. The mobile Dataram was combined with a GPS unit using the real-time data collection software FAST. Four rounds of FAST perimeter monitoring were conducted throughout the day.



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Crawford and Fisk Station Sites
January 31, 2013

December 5, 2012

U.S. EPA and WESTON START personnel returned to the Crawford Station Site to conduct further site reconnaissance and particulate air monitoring activities on a non-windy day. On-site work activities included stack demolition in the central area of the Site, resulting in no visible dust. Off-site activities noted in the surrounding area included semi-truck traffic on Cougar Street to the north, creating visible dust; active industrial and commercial properties to the east; asphalt production activities and the I-55 corridor beyond the Chicago Sanitary and Ship Canal to the south; concrete-crushing operations to the southwest; and heavy traffic on South Pulaski Road to the west.

Perimeter particulate air monitoring was conducted using the same four stationary Dataram locations shown in **Figure A-2a** and one mobile Dataram. The stationary Datarams were attached to tripods approximately 4 feet above the ground surface. At the stationary air monitoring locations, continuous, real-time particulate monitoring data were logged using the wireless sensor communication system software VIPER over an approximate 8-hour time period. An Oregon Scientific WMR200A weather station was set up at the same location as on December 3, 2012 (**Figure A-2a**) to track weather conditions during air monitoring activities.

Figure A-3a in **Attachment A** shows the mobile Dataram air monitoring locations at the Crawford Station Site. The mobile Dataram was combined with a GPS unit using the real-time data collection software FAST. Four rounds of FAST perimeter monitoring were conducted throughout the day.

December 6, 2012

U.S. EPA and WESTON START personnel returned to the Fisk Station Site to conduct further site reconnaissance and particulate air monitoring activities on a non-windy day. On-site work activities included concrete saw-cutting and trenching in the north end of the Site and pipe repair activities in the south end of the Site, resulting in visible dust. Off-site activities noted in the surrounding area included heavy traffic on West Cermak Road and occasional rail activity to the north, concrete production and construction debris stockpiling activities to the east, and industrial construction yard activities beyond the South Branch of the Chicago River to the south.

Perimeter particulate air monitoring was conducted using the same four stationary Dataram locations shown in **Figure A-2b** and one mobile Dataram. The stationary Datarams were attached to tripods approximately 4 feet above the ground surface. At the stationary air monitoring locations, continuous, real-time particulate monitoring data were logged using the wireless sensor communication system software VIPER over an approximate 8-hour time period. An Oregon Scientific WMR200A weather station was set up at the same location as on December 4, 2012 (**Figure A-2b**) to track weather conditions during air monitoring activities.



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Crawford and Fisk Station Sites
January 31, 2013

Figure A-3b in **Attachment A** shows the mobile Dataram air monitoring locations at the Fisk Station Site. The mobile Dataram was combined with a GPS unit using the real-time data collection software FAST. Four rounds of FAST perimeter monitoring were conducted throughout the day.

U.S. EPA personnel conducted mobile gamma radiation screening in neighborhoods around the Fisk Station Site using a Victoreen 451P Pressurized Ion Chamber. The U.S. EPA identified four distinct residential areas for gamma radiation screening in the neighborhood of the Fisk Station Site. **Figure A-4b** in **Attachment A** shows the gamma radiation screening locations in the vicinity of the Fisk Station Site. The radiation detector was combined with a GPS unit using FAST software.

December 7, 2012

U.S. EPA personnel conducted mobile gamma radiation screening in neighborhoods around the Crawford Station Site using a Victoreen 451P Pressurized Ion Chamber. The U.S. EPA identified four distinct residential areas for gamma radiation screening in the neighborhood of the Crawford Station Site. **Figure A-4a** in **Attachment A** shows the gamma radiation screening locations in the vicinity of the Crawford Station Site. The radiation detector was combined with a GPS unit using FAST software.

December 10, 2012

U.S. EPA personnel conducted mobile gamma radiation screening in Chicago reference neighborhoods using a Victoreen 451P Pressurized Ion Chamber. The U.S. EPA identified four distinct residential area reference neighborhoods for gamma radiation screening, including Andersonville, Irving Park, Lincoln Park, and Wicker Park. **Figure A-4c** in **Attachment A** shows the gamma radiation screening Chicago reference locations. The radiation detector was combined with a GPS unit using FAST software.

PERIMETER PARTICULATE AIR MONITORING AND GAMMA RADIATION SCREENING RESULTS

Perimeter particulate air monitoring using four stationary Datarams and one mobile Dataram was conducted on December 3 and 5, 2012, at the Crawford Station Site and on December 4 and 6, 2012, at the Fisk Station Site. **Figures A-2a** and **A-2b** in **Attachment A** show the stationary Dataram particulate monitoring locations, weather station locations, and surrounding commercial and industrial properties at the Crawford Station and Fisk Station Sites, respectively. **Tables C-2 and C-3** in **Attachment C** summarize weather data and combined hourly average stationary particulate monitoring results for the Crawford and Fisk Station Sites, respectively.



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Crawford and Fisk Station Sites
January 31, 2013

Crawford Station Site stationary Dataram particulate hourly time-weighted average (TWA) concentrations ranged from 31.4 to 96.3 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) on December 3, 2012 (windy day), and from 3.8 to 15.4 $\mu\text{g}/\text{m}^3$ on December 5, 2012 (non-windy day). Fisk Station Site stationary Dataram particulate hourly TWA concentrations ranged from 2.8 to 8.2 $\mu\text{g}/\text{m}^3$ on December 4, 2012 (windy day), and from 17.2 to 26.2 $\mu\text{g}/\text{m}^3$ on December 6, 2012 (non-windy day). **Charts D-1 through D-4 in Attachment D** show the hourly TWA particulate concentrations with respect to the percent relative humidity for each day. Stationary Dataram particulate concentration measurements typically increased with increasing relative humidity.

Figures A-3a and A-3b in Attachment A show the mobile Dataram particulate monitoring locations, weather station locations, and surrounding commercial and industrial properties at the Crawford Station and Fisk Station Sites, respectively. Crawford Station Site mobile Dataram particulate concentrations ranged from 9.8 to 77.2 $\mu\text{g}/\text{m}^3$ on December 3, 2012, and from 1.4 to 181.2 $\mu\text{g}/\text{m}^3$ on December 5, 2012. Fisk Station Site mobile Dataram particulate concentrations ranged from 1.0 to 138.3 $\mu\text{g}/\text{m}^3$ on December 4, 2012, and from 18.3 to 1,053.9 $\mu\text{g}/\text{m}^3$ on December 6, 2012. The Fisk Station Site had a mobile Dataram particulate concentration spike ranging from 51.9 to 1,053.9 $\mu\text{g}/\text{m}^3$ during a 20-second time span on December 6, 2012. The spike was attributed to dust generated by field personnel moving the carriage that was holding the Dataram monitor. Except for the mobile Dataram particulate concentration spike, the maximum mobile Dataram particulate concentration on December 6, 2012, was 76.4 $\mu\text{g}/\text{m}^3$.

On December 4 and December 6 through 10, 2012, off-site gamma radiation screening was conducted in neighborhoods around the Crawford and Fisk Station Sites and in Chicago reference neighborhoods. **Figures A-4a through A-4c in Attachment A** show the off-site gamma radiation screening results. Gamma radiation screening results for neighborhoods around the Crawford Station Site ranged from 0.00 to 0.34 micro-Sieverts per hour ($\mu\text{Sv}/\text{hr}$). Gamma radiation screening results for neighborhoods around the Fisk Station Site ranged from 0.00 to 0.46 $\mu\text{Sv}/\text{hr}$. Gamma radiation screening results for the Chicago reference neighborhoods ranged from 0.00 to 0.73 $\mu\text{Sv}/\text{hr}$, with the highest readings located in the Lincoln Park neighborhood.

SUMMARY

During the Site activities, the U.S. EPA and WESTON START conducted a site reconnaissance, perimeter particulate air monitoring, and gamma radiation screening at the Crawford Station and Fisk Station Sites. Particulate air monitoring and gamma radiation screening were conducted to report the results and compare gamma radiation dose rate levels found in residential areas surrounding the Sites to those found in other Chicago neighborhoods.

At each Site, perimeter particulate air monitoring activities were conducted using four stationary Datarams and one mobile Dataram during windy and non-windy days. At the stationary air



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Crawford and Fisk Station Sites
January 31, 2013

monitoring locations, continuous, real-time particulate monitoring data were logged using the wireless sensor communication system software VIPER over an approximate 8-hour time period. The mobile Dataram was combined with a GPS unit using the real-time data collection software FAST. An Oregon Scientific WMR200A weather station was set up at each Site to track weather conditions during air monitoring activities on each day. Gamma radiation screening was conducted in distinct residential areas in the neighborhoods of the Crawford Station and Fisk Station Sites and in Chicago reference neighborhoods. A Victoreen 451P Pressurized Ion Chamber was combined with a GPS unit using FAST software for gamma radiation screening.

SCRIBE, SCRIBE.NET, Response Manager, and ArcGIS products were used throughout each day to post data to a Flex Viewer Site. The Flex Viewer Site was accessible through an internet connection and allowed viewing of real-time and geographically current datasets during Site activities. SCRIBE and Response Manager were configured to support the data quality objectives, and the Flex Viewer site was configured to show the data streams selected by the U.S. EPA.

This letter report serves as the final deliverable for these TDDs. WESTON START anticipates no further activities under this TDD. If you have any questions or comments about the report or need additional copies, please contact me at (847) 918-4084.

Very truly yours,
WESTON SOLUTIONS, INC.

A handwritten signature in blue ink, appearing to read "Ben Maradkel", is written over a blue horizontal line.

Ben Maradkel
WESTON START Project Manager

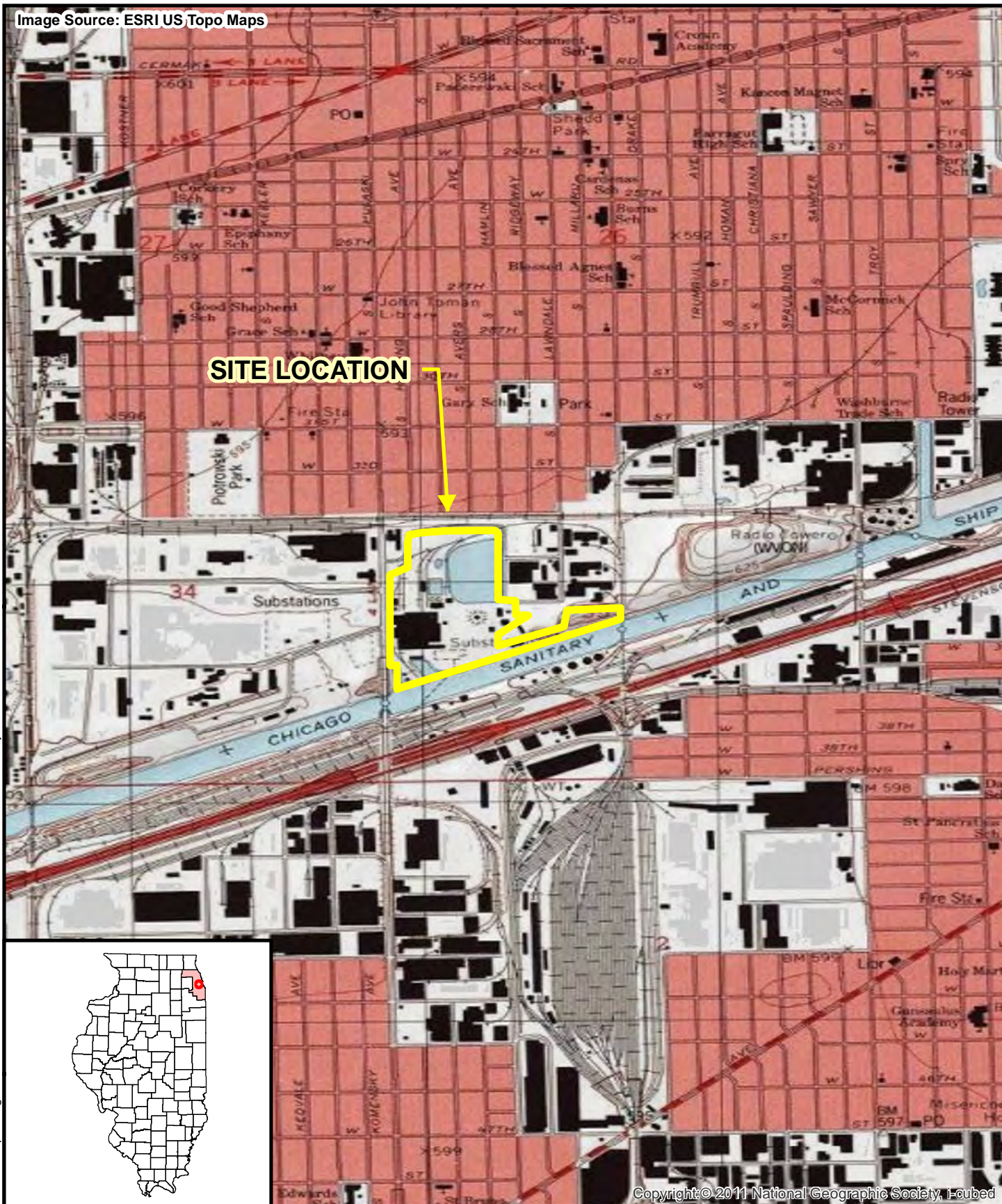
Attachments:

- A – Figures
- B – Photographic Documentation
- C – Tables
- D – Charts

cc: WESTON START DCN File

ATTACHMENT A
FIGURES

Image Source: ESRI US Topo Maps



Copyright © 2011 National Geographic Society, Inc.

Legend

 Site Boundary

0 2,000
Feet



Prepared for:
U.S. EPA REGION V

Contract No.: EP-S5-06-04
TDD: S05-0001-1210-016
DCN: 2014-2A-BBWE



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SOLUTIONS, INC**

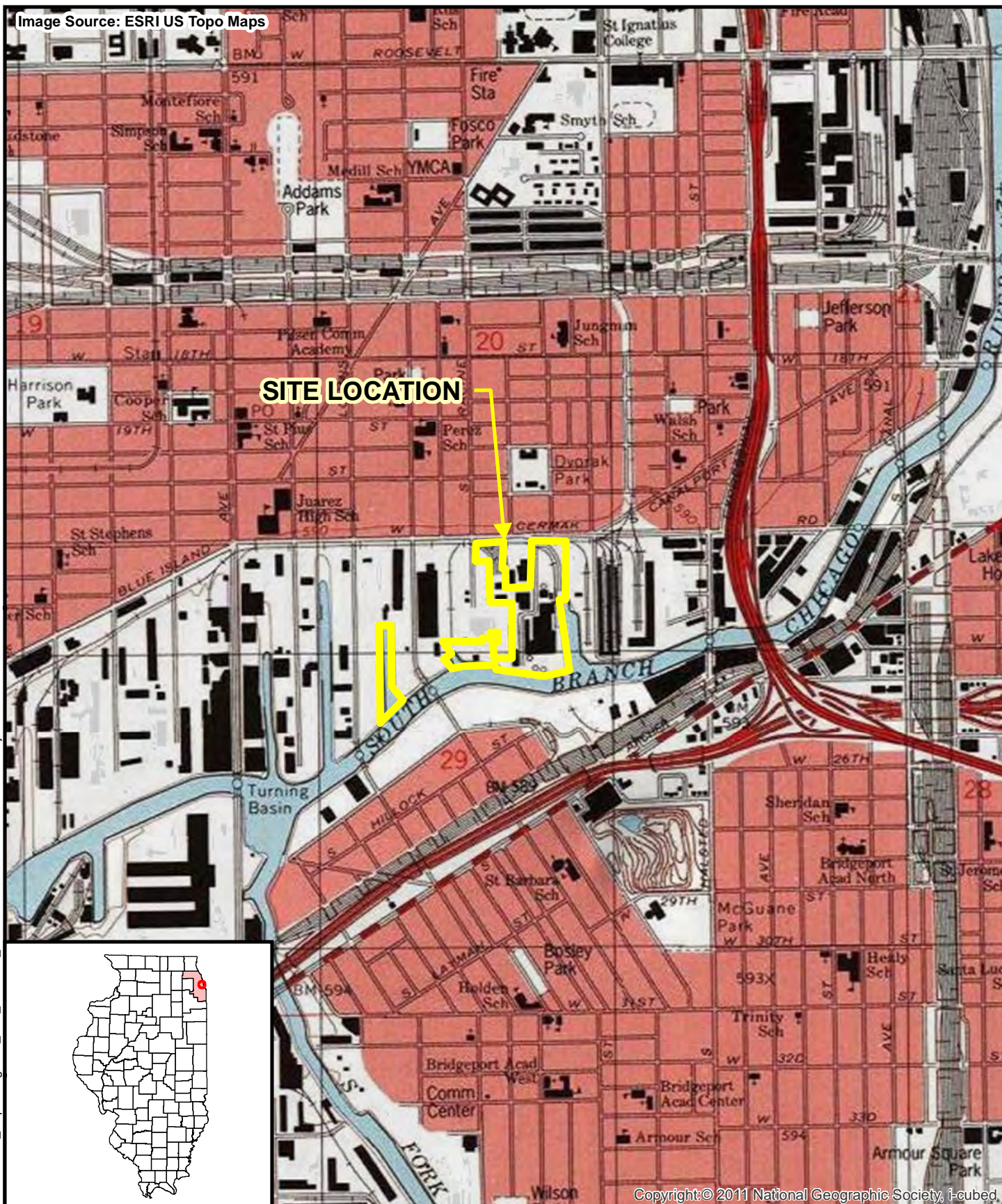
750 E. Bunker Court
Suite 500
Vernon Hills, Illinois 60061

Figure A-1a

Site Location Map

Midwest Generation-Crawford Station
Chicago, Cook County, Illinois

Image Source: ESRI US Topo Maps



Legend

 Site Location

0 2,000
Feet



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Contract No.: EP-S5-06-04
TDD: S05-0001-1210-018
DCN: 2014-2A-BBWE



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Suite 500
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Figure A-1b
Site Location Map
Midwest Generation-Fisk Station
Chicago, Cook County, Illinois

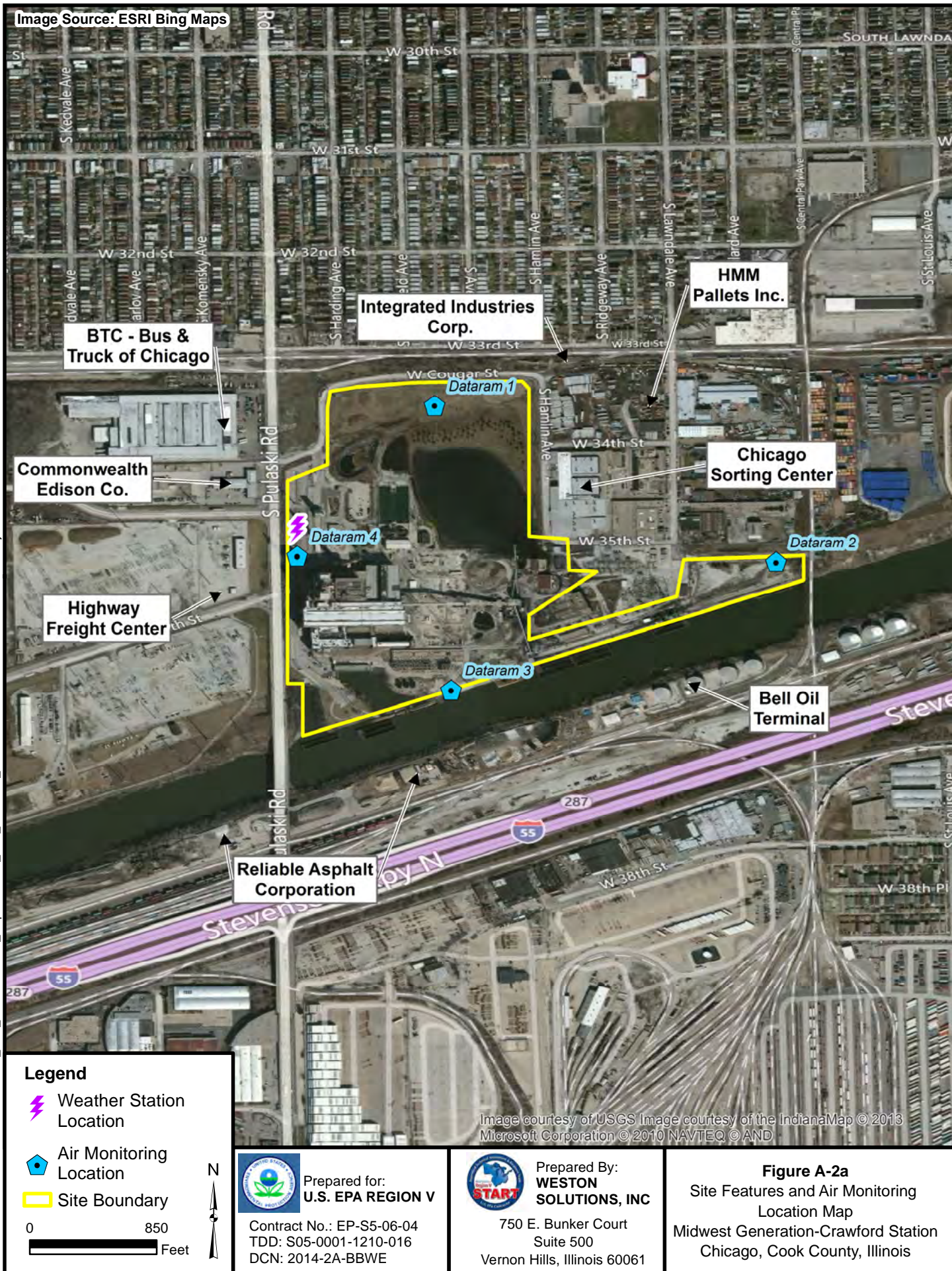
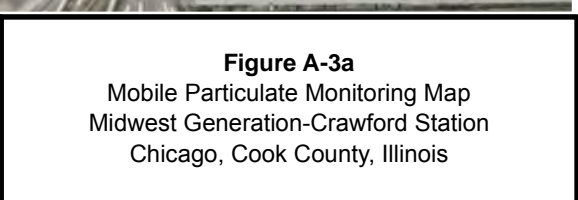
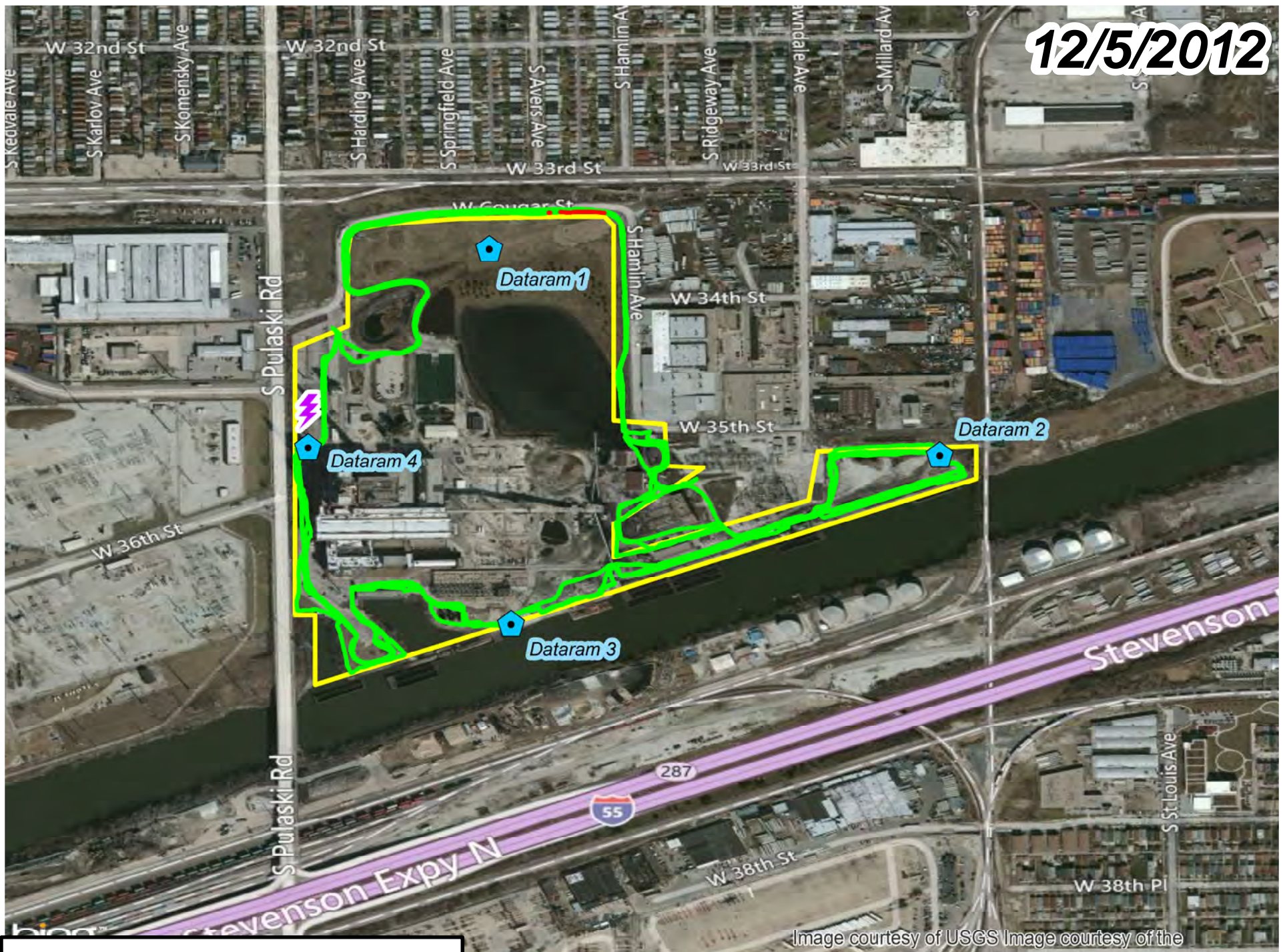
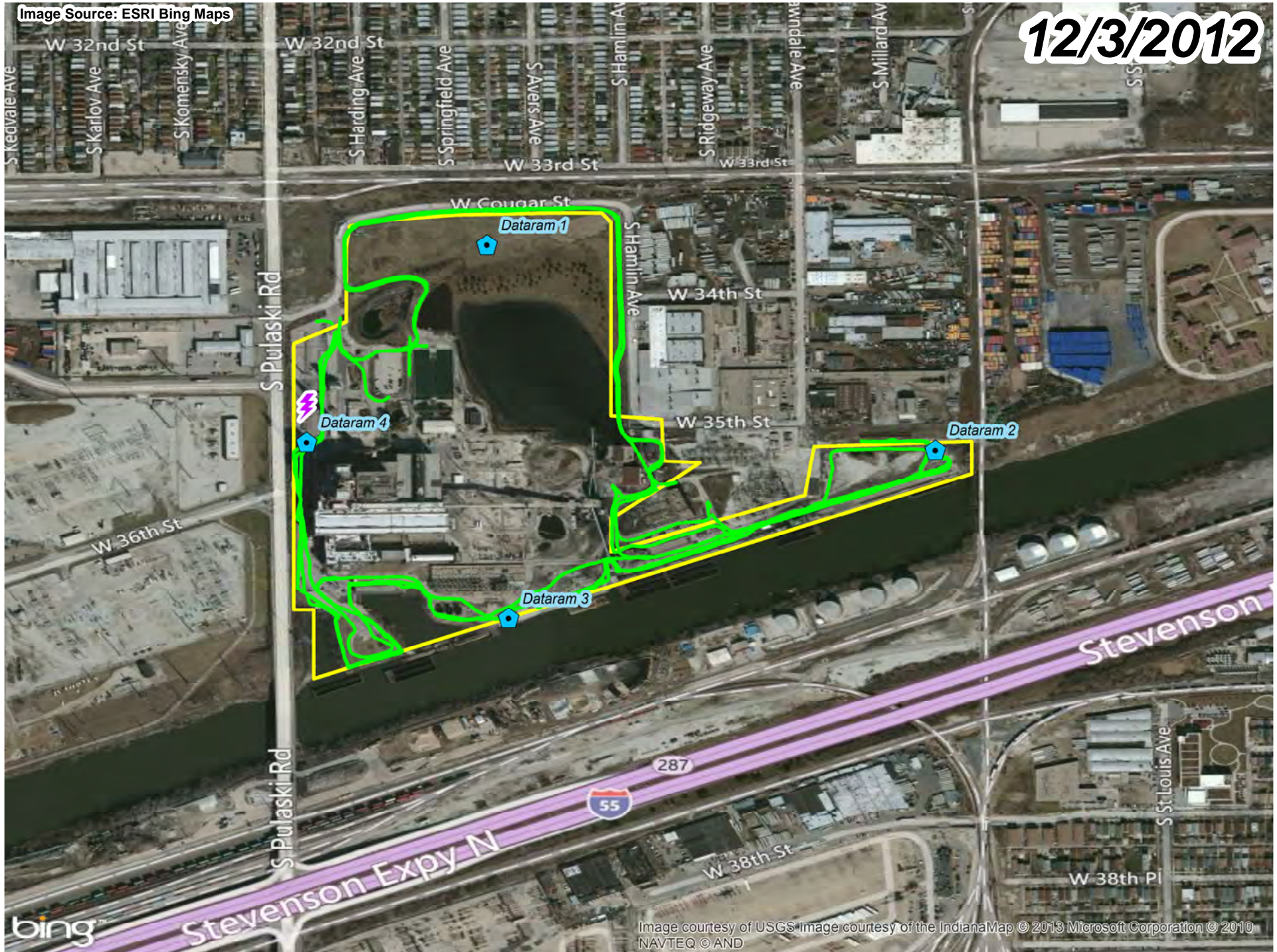
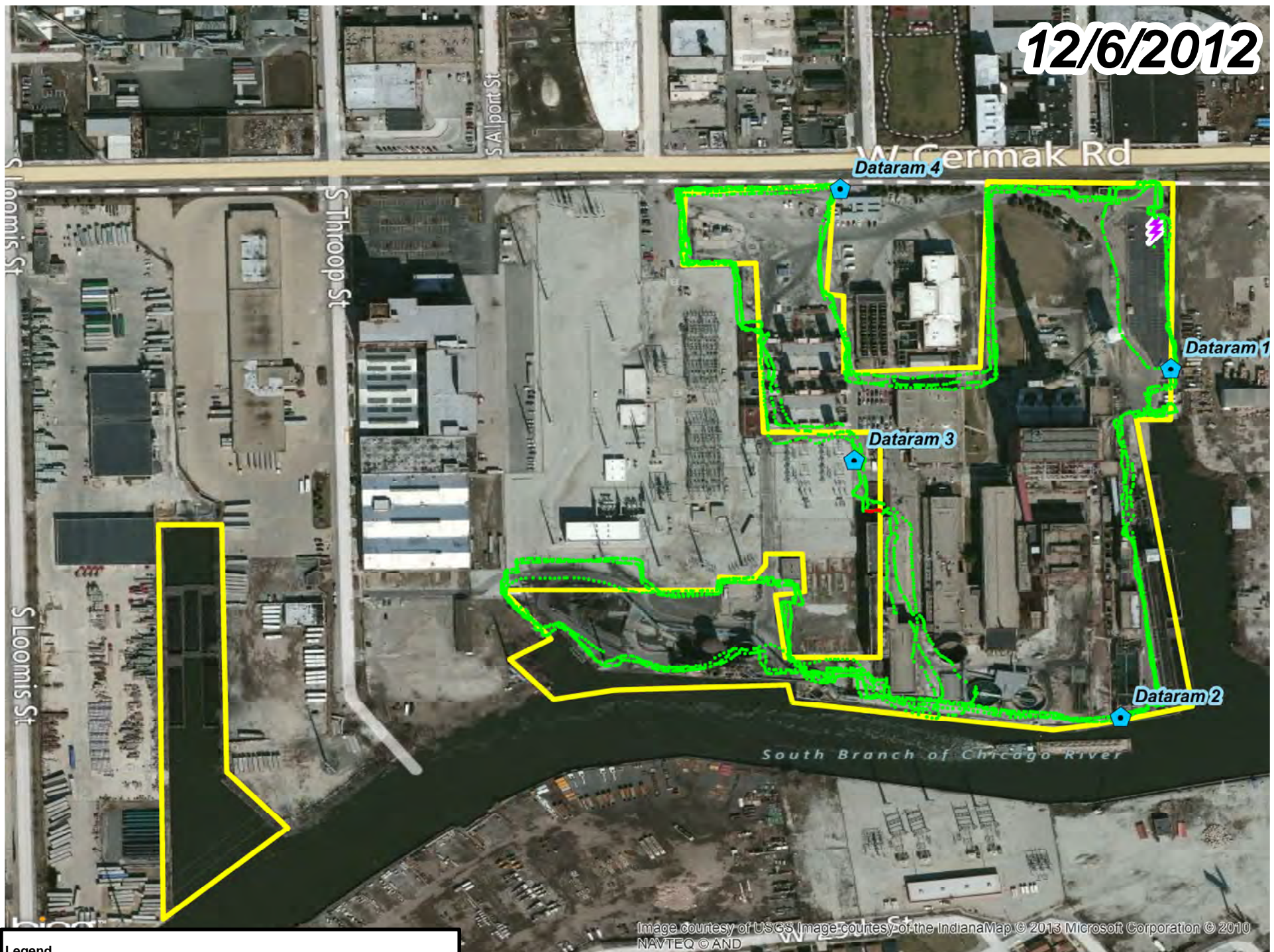
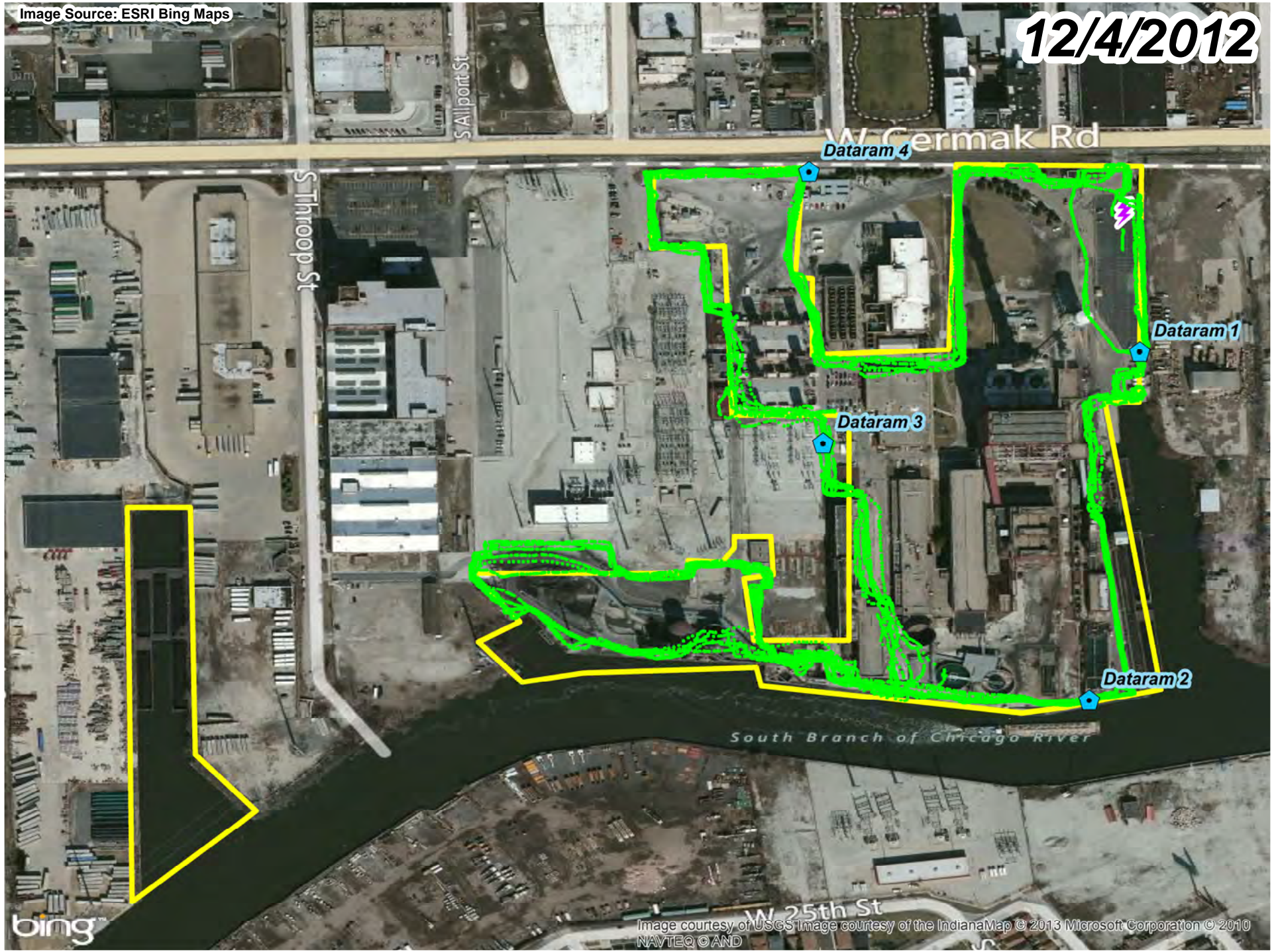




Figure A-2b
Site Features and Air Monitoring
Location Map
Midwest Generation-Fisk Station
Chicago, Cook County, Illinois





Legend

FAST Particulate Monitoring

- 0.0 – 149.9 $\mu\text{g}/\text{m}^3$
- > 150 $\mu\text{g}/\text{m}^3$

⬡ Air Monitoring Location

⬢ Site Boundary

⚡ Weather Station Location

0 350 Feet

N

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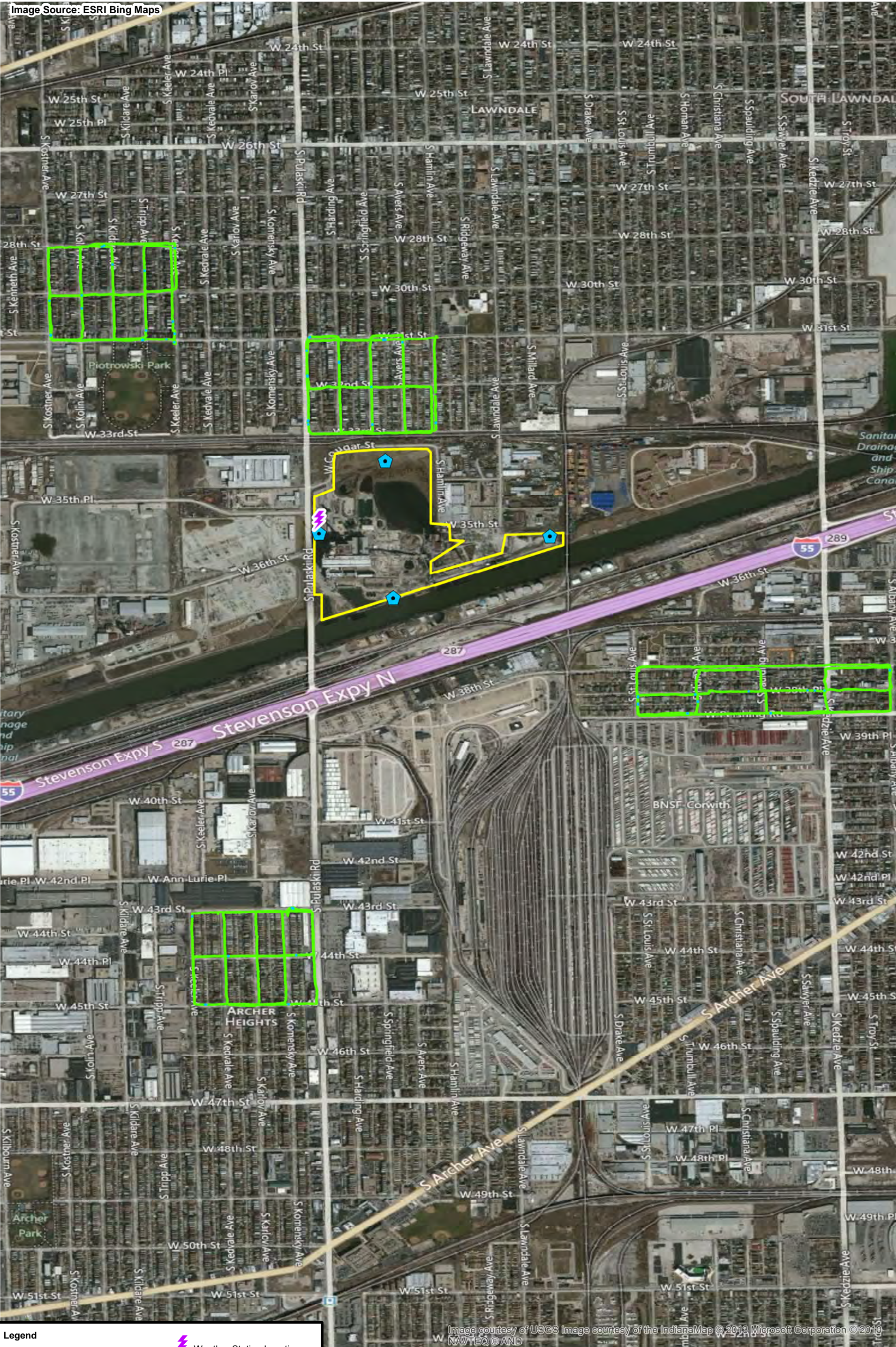
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Figure A-3b
Mobile Particulate Monitoring Map
Midwest Generation-Fisk Station
Chicago, Cook County, Illinois

Image Source: ESRI Bing Maps



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Gamma Radiation Monitoring


- 0.00 - 0.20 $\mu\text{Sv/hr}$
- 0.21 - 0.40 $\mu\text{Sv/hr}$
- 0.41 - 0.60 $\mu\text{Sv/hr}$
- 0.61 - 0.80 $\mu\text{Sv/hr}$
- 0.81 - 20.0 $\mu\text{Sv/hr}$
- >20.0 $\mu\text{Sv/hr}$

Weather Station Location

Air Monitoring Location

Site Boundary

0 1,250 Feet



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Figure A-4a

Gamma Radiation Screening Map
Midwest Generation-Crawford Station
Chicago, Cook County, Illinois

Image Source: ESRI Bing Maps

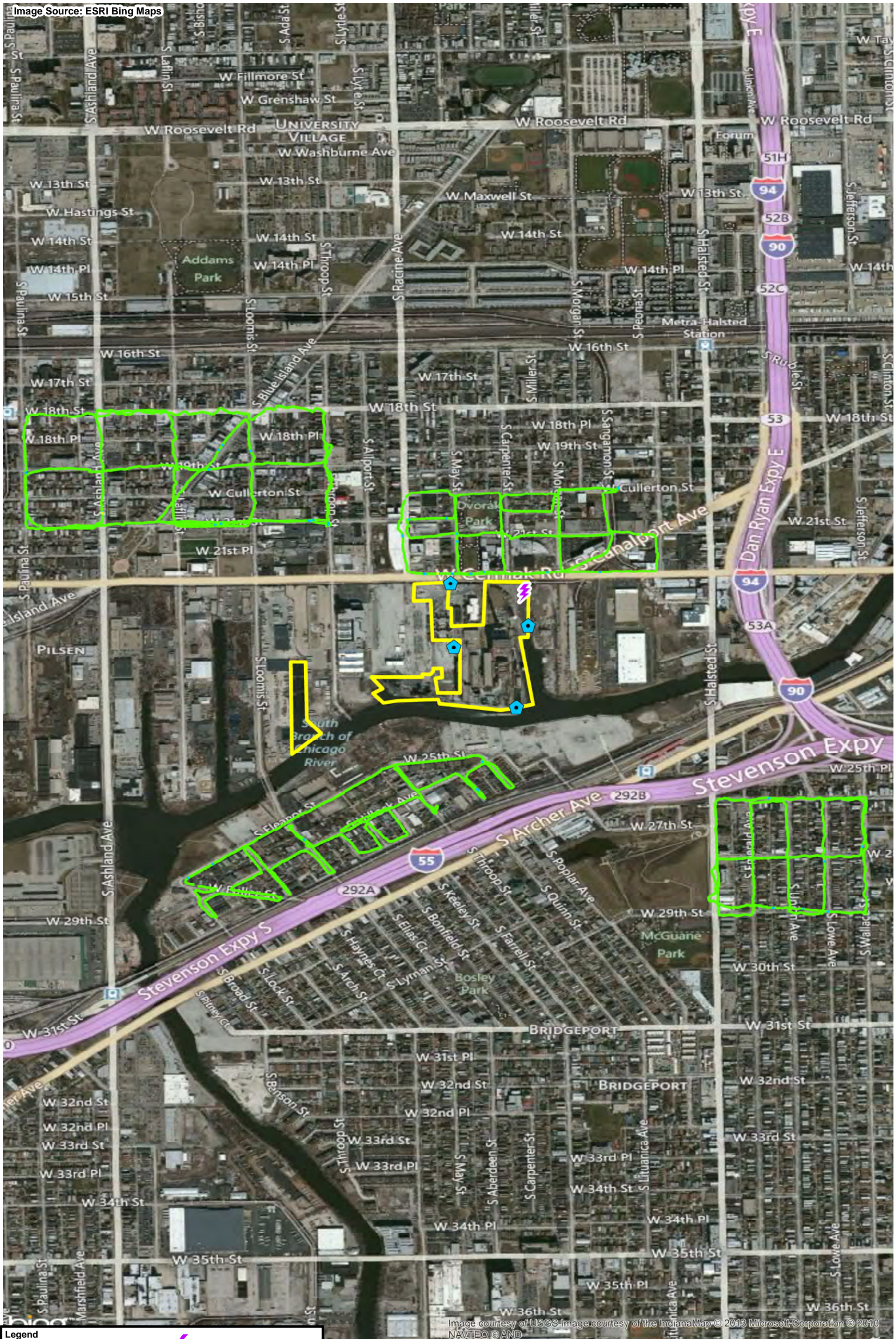


Image courtesy of USGS Image courtesy of the IndianaMap © 2013 Microsoft Corporation © 2010 NAVTEQ © AND

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Gamma Radiation Monitoring

- 0.00 - 0.20 µSv/hr
- 0.21 - 0.40 µSv/hr
- 0.41 - 0.60 µSv/hr
- 0.61 - 0.80 µSv/hr
- 0.81 - 20.0 µSv/hr
- >20.0 µSv/hr

Weather Station Location

Air Monitoring Location

Site Boundary

0 1,050 Feet



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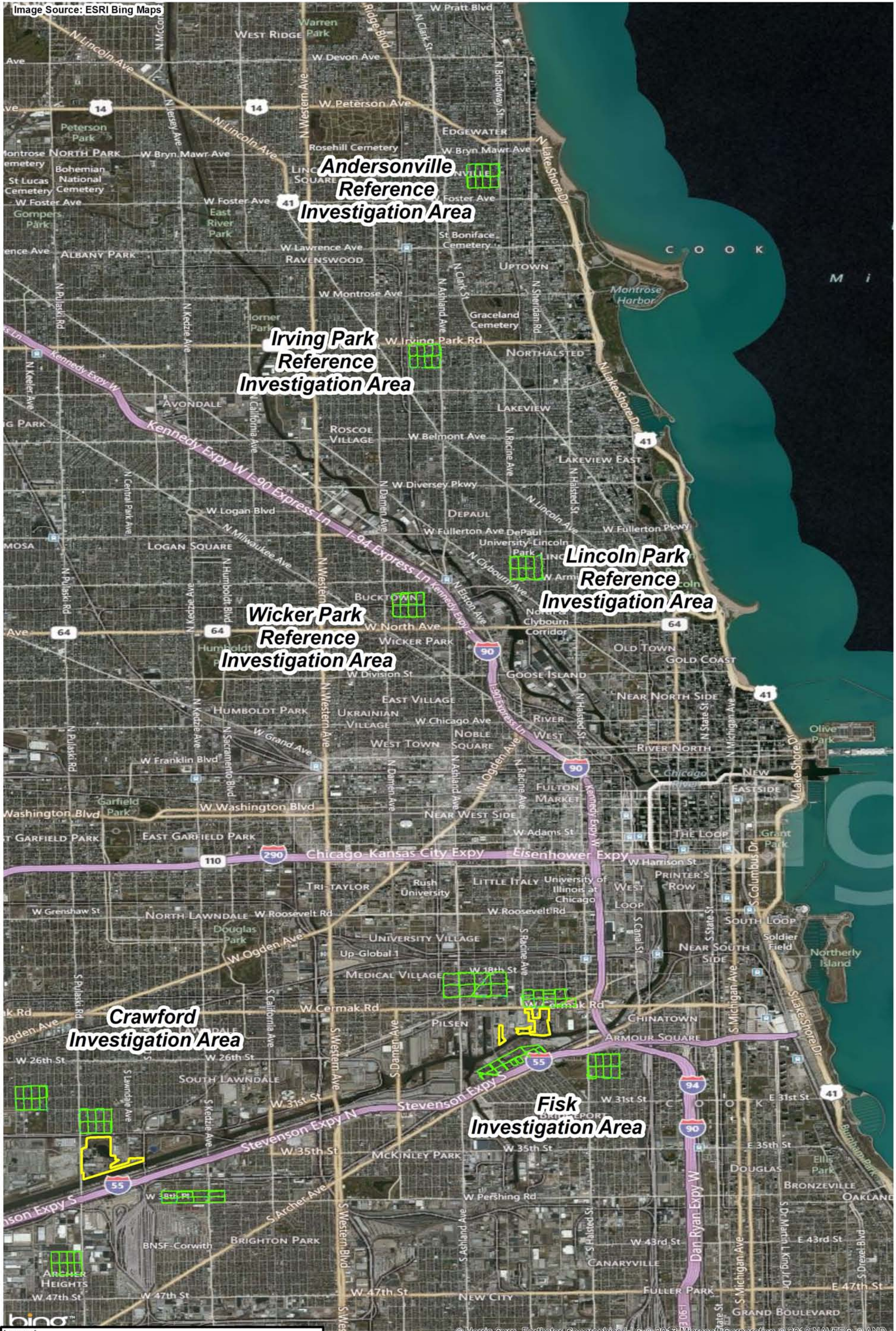
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Figure A-4b
Gamma Radiation Screening Map
Midwest Generation-Fisk Station
Chicago, Cook County, Illinois



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Gamma Radiation Monitoring

- 0.00 - 0.20 µSv/hr
- 0.21 - 0.40 µSv/hr
- 0.41 - 0.60 µSv/hr
- 0.61 - 0.80 µSv/hr
- 0.81 - 20.0 µSv/hr
- >20.0 µSv/hr

Site Boundary

0 5,000 Feet

 Prepared for: U.S. EPA REGION V Contract No.: EP-S5-06-04 TDD: S05-0001-1210-016 and -018 DCN: 2014-2A-BBWE	 Prepared By: WESTON SOLUTIONS, INC 750 E. Bunker Court Suite 500 Vernon Hills, Illinois 60061	Figure A-4c Chicago Reference Gamma Radiation Screening Map Midwest Generation- Crawford and Fisk Station Chicago, Cook County, Illinois
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ATTACHMENT B
PHOTOGRAPHIC DOCUMENTATION



Site: Crawford Station Site

Photograph No.: 1

Direction: South

Subject: Covered Dataram setup at location Dataram 3 on south end of Site, with industrial demolition operations to south

Date: 12/3/12

Photographer: Marcus Muccianti



Site: Fisk Station Site

Photograph No.: 2

Direction: North

Subject: Dataram setup at location Dataram 4 on north end of Site, with railroad tracks and West Cermak Road to north

Date: December 4, 2012

Photographer: Marcus Muccianti



Site: Crawford Station Site

Photograph No.: 3

Direction: West

Subject: Site VIPER setup with booster antennae signals communicating with perimeter Datarams

Date: 12/5/12

Photographer: Shauna Marie Ross



Site: Crawford Station Site

Photograph No.: 4

Direction: Northeast

Subject: Dataram setup at location Dataram 2 on southeast corner of Site, with trucking operations to east

Date: 12/5/12

Photographer: Shauna Marie Ross



Site: Fisk Station Site

Photograph No.: 5

Direction: Northeast

Subject: FAST setup on southeast area of Site, with concrete mixing operations to east

Date: 12/6/12

Photographer: Shauna Marie Ross



Site: Fisk Station Site

Photograph No.: 6

Direction: Northwest

Subject: Weather station setup located on northeast area of Site

Date: 12/6/12

Photographer: Shauna Marie Ross

**ATTACHMENT C
TABLES**

Table C-1
Pasquill-Gifford Stability Index Class Descriptions
Midwest Generation – Crawford Station and Fisk Station Sites
Chicago, Cook County, Illinois

Pasquill-Gifford Stability Index Class	Wind Conditions	Description¹
A	Windy; very unstable	Daytime; strong insolation and wind speed less than 7 mph or moderate insolation and wind speed less than 4 mph
B	Windy; unstable	Daytime; strong insolation and wind speed between about 7 and 11 mph, moderate insolation and wind speed between 4 and 9 mph, or slight insolation and wind speed less than 4 mph
C	Windy; slightly unstable	Daytime; strong insolation and wind speed greater than 11 mph, moderate insolation and wind speed between 9 and about 12 mph, or slight insolation and wind speed between 4 and 11 mph
D	Non-windy; neutral	All overcast sky conditions, day or night; daytime, moderate insolation and wind speed greater than 12 mph; daytime, slight insolation and wind speed greater than 11 mph; nighttime, wind speed greater than 11 mph; or nighttime, more than 50% cloud cover or with thin overcast skies and wind speed greater than 7 mph
E	Non-windy; slightly stable	Nighttime; thin overcast skies or more than 50% cloud cover and wind speed less than 7 mph or less than 50% cloud cover and wind speed between 7 and 11 mph
F	Non-windy; stable	Nighttime; less than 50% cloud cover and wind speed less than 7 mph

Notes:

mph = Miles per hour

Table C-2
Average Hourly Weather and Particulate Data
Midwest Generation – Crawford Station Site
Chicago, Cook County, Illinois

Date	Time	Weather Information ¹					Particulate TWA (µg/m ³)			
		Temperature (°F)	Barometer (inches)	Relative Humidity (%)	Originating Wind Direction	Wind Speed (mph)	Location			
							Dataram 1	Dataram 2	Dataram 3	Dataram 4
December 3, 2012 ²	10:00 a.m.	62.8	29.61	73	S	13	77.2	84.1	96.3	96.2
	11:00 a.m.	64.2	29.88	73	S	11	69.5	77.5	89.5	88.7
	12:00 p.m.	67.1	29.84	69	S	12	61.4	69.8	80.6	79.5
	1:00 p.m.	71.1	29.81	61	S	17	52.7	60.4	71.9	68.8
	2:00 p.m.	71.1	29.78	60	S	21	45.5	52.4	62.8	59.4
	3:00 p.m.	71.1	29.77	58	S	20	39.8	46.2	55.7	52.0
	4:00 p.m.	70.0	29.81	61	SSW	17	35.4	41.4	50.4	46.2
	5:00 p.m.	68.0	29.80	63	SSW	15	32.2	37.9	46.7	41.9
	6:00 p.m.	66.9	29.81	62	SSW	23	31.4	37.7	--	41.8
Average		68.0	29.79	64	SSW	17	49.5	56.4	69.2	63.8
December 5, 2012 ³	9:00 a.m.	36.4	29.70	39	NE	3	4.4	15.4	8.4	7.7
	10:00 a.m.	37.8	29.74	45	NNE	3	4.2	11.6	9.1	5.7
	11:00 a.m.	38.1	29.75	47	NNE	5	4.3	12.6	8.5	4.7
	12:00 p.m.	43.7	29.74	47	ENE	3	4.9	11.7	8.1	4.5
	1:00 p.m.	45.2	29.74	45	ESE	2	5.3	10.2	7.3	4.4
	2:00 p.m.	42.9	29.71	45	ENE	3	6.1	9.3	6.9	4.3
	3:00 p.m.	39.6	29.67	46	ENE	2	6.5	8.4	7.2	4.0
	4:00 p.m.	37.0	29.66	49	ENE	2	7.2	7.9	4.0	3.8
	5:00 p.m.	40.5	29.62	54	NE	0	7.2	7.6	4.5	4.0
Average		40.1	29.70	46	ENE	3	5.6	10.5	7.1	4.8

Notes:

-- = Not measured

% = Percent

µg/m³ = Microgram per cubic meter

ENE = East-northeast

ESE = East-southeast

°F = Degree Fahrenheit

mph = Mile per hour

N = North

NE = Northeast

NNE = North-northeast

S = South

SSE = South-southeast

SSW = South-southwest

TWA = Time-weighted average

¹ Weather information for December 3, 2012, from Weather Underground for a weather station at Chicago Midway International Airport in Chicago, Illinois; weather information for December 5, 2012, from the on-site weather station

² Overall weather conditions observed by Site personnel on December 3, 2012 was misty in the morning, windy in the afternoon, and with predominant winds from the SW direction

³ Overall weather conditions observed by Site personnel on December 5, 2012 was cold, calm, and with predominant winds from the NE direction

Table C-3
Average Hourly Weather and Particulate Data
Midwest Generation – Fisk Station Site
Chicago, Cook County, Illinois

Date	Time	Weather Information ¹					Particulate TWA (µg/m ³)			
		Temperature (°F)	Barometer (inches)	Relative Humidity (%)	Originating Wind Direction	Wind Speed (mph)	Location			
							Dataram 1	Dataram 2	Dataram 3	Dataram 4
December 4, 2012 ²	9:00 a.m.	52.3	30.00	40	SSW	8	4.0	5.8	7.5	8.2
	10:00 a.m.	57.9	30.14	36	WSW	4	3.9	5.6	6.5	8.2
	11:00 a.m.	55.7	29.58	35	WSW	4	3.7	5.3	5.9	7.8
	12:00 p.m.	54.6	30.00	35	ESE	9	3.3	4.9	5.3	7.3
	1:00 p.m.	57.6	29.70	33	SW	6	3.0	4.8	5.0	7.0
	2:00 p.m.	58.4	30.69	33	SSW	6	2.9	4.9	5.0	6.8
	3:00 p.m.	57.8	29.77	34	WSW	7	2.8	4.8	4.8	6.8
	4:00 p.m.	55.9	29.80	38	SE	4	2.8	4.8	4.8	6.7
	5:00 p.m.	55.1	29.96	41	ESE	6	2.9	4.8	4.9	6.8
Average		56.1	29.96	36	WSW	6	3.3	5.1	5.5	7.3
December 6, 2012 ³	7:00 a.m.	35.5	29.44	42	SSE	3	19.1	17.2	18.4	19.5
	8:00 a.m.	35.5	29.44	56	SSE	2	23.2	21.7	20.7	21.7
	9:00 a.m.	37.3	29.43	61	SSW	3	25.3	24.6	23.4	24.5
	10:00 a.m.	39.9	29.43	62	SSW	2	26.1	25.7	24.6	25.6
	11:00 a.m.	42.8	29.37	60	SSW	3	26.2	26.2	25.2	26.1
	12:00 p.m.	45.0	29.36	57	SSW	3	26.1	26.0	25.1	25.8
	1:00 p.m.	45.6	29.31	56	SSW	3	25.8	25.8	25.0	25.7
	2:00 p.m.	45.7	29.26	57	SSW	3	25.3	25.5	24.8	25.6
	3:00 p.m.	45.6	29.26	60	SSE	3	25.2	25.5	24.9	25.7
	4:00 p.m.	44.9	29.26	61	SSE	3	25.2	25.5	25.0	25.9
Average		41.8	29.36	57	SSW	3	24.8	24.4	23.7	24.6

Notes:

% = Percent

µg/m³ = Microgram per cubic meter

ESE = East-southeast

°F = Degree Fahrenheit

mph = Mile per hour

SE = Southeast

SSE = South-southeast

SSW = South-southwest

SW = Southwest

TWA = Time-weighted average

WSW = West-southwest

¹ Weather information for 9:00 a.m. on December 4, 2012, from Weather Underground for a weather station in the River North neighborhood in Chicago, Illinois; weather information for all other times on December 4, 2012, combined weather information from the on-site weather station and Weather Underground for a weather station in the River North neighborhood; weather information for December 6, 2012, from the on-site weather station

² Overall weather conditions observed by Site personnel on December 4, 2012 was sunny, windy, and with predominant winds from the SW direction

³ Overall weather conditions observed by Site personnel on December 6, 2012 was cold, calm, and with predominant winds from the SSW direction

**ATTACHMENT D
CHARTS**

Chart D-1
 Particulate Concentration vs. Relative Humidity – December 3, 2012
 Midwest Generation – Crawford Station Site
 Chicago, Cook County, Illinois.

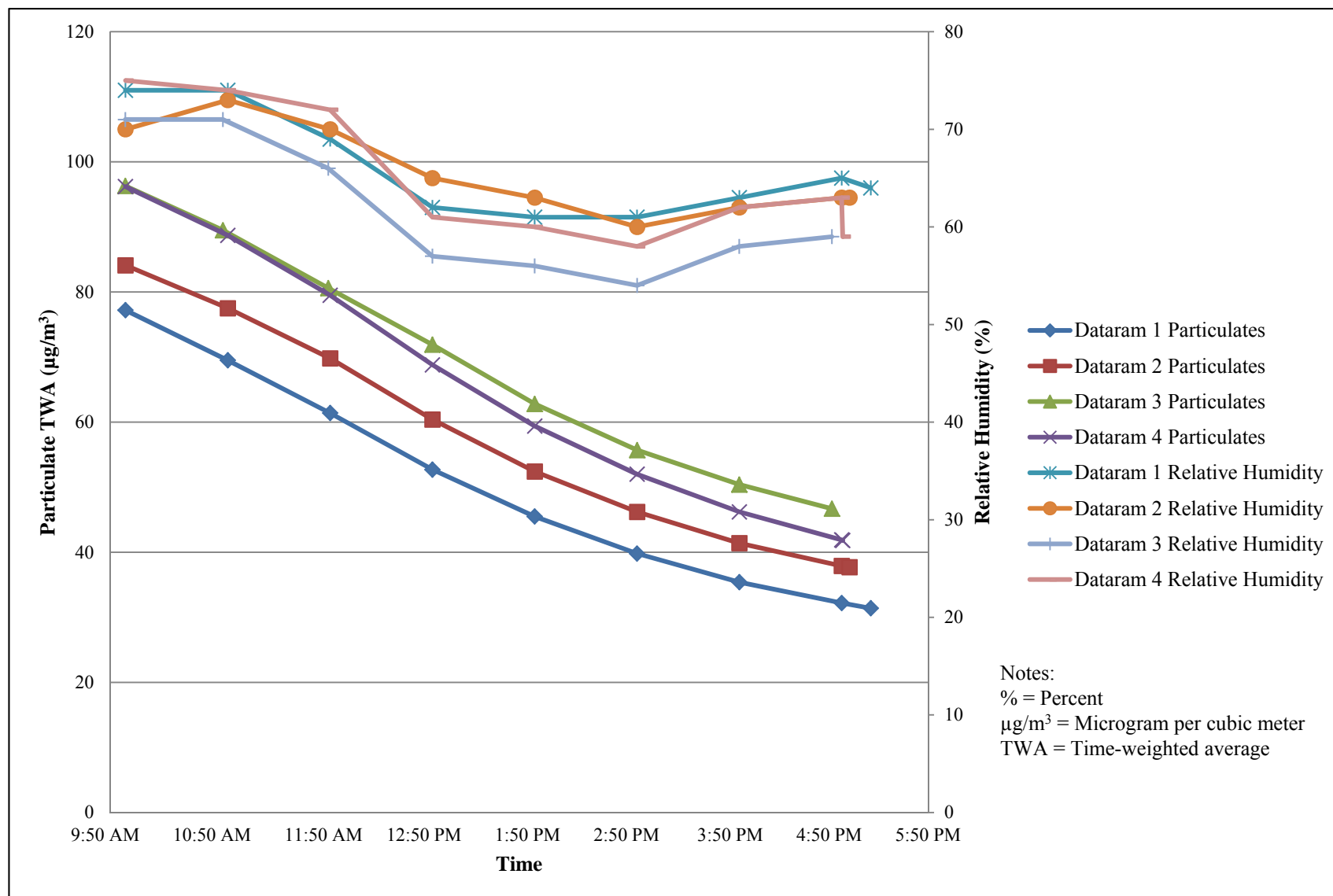


Chart D-2
 Particulate Concentration vs. Relative Humidity – December 4, 2012
 Midwest Generation – Fisk Station Site
 Chicago, Cook County, Illinois.

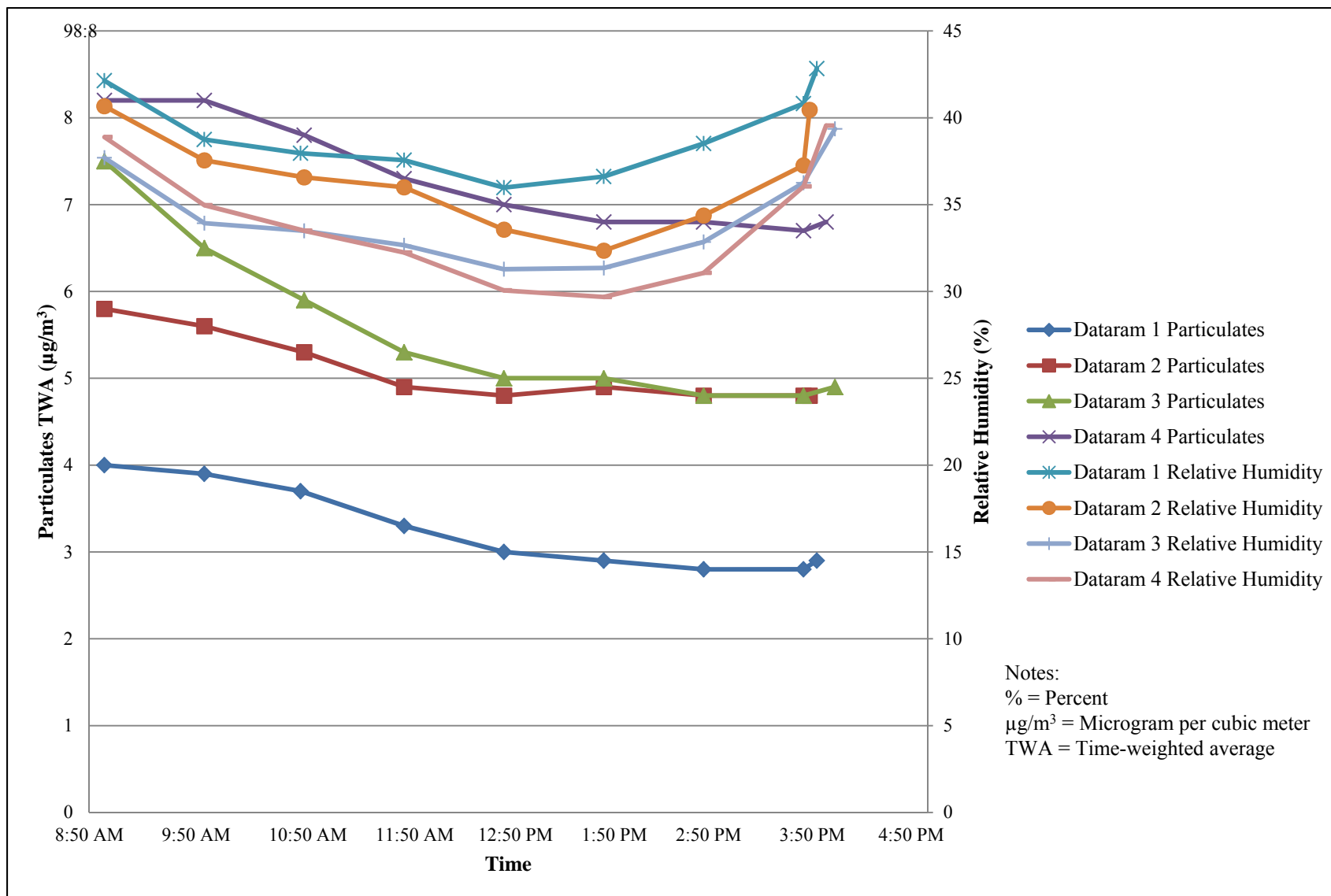


Chart D-3
 Particulate Concentration vs. Relative Humidity – December 5, 2012
 Midwest Generation – Crawford Station Site
 Chicago, Cook County, Illinois.

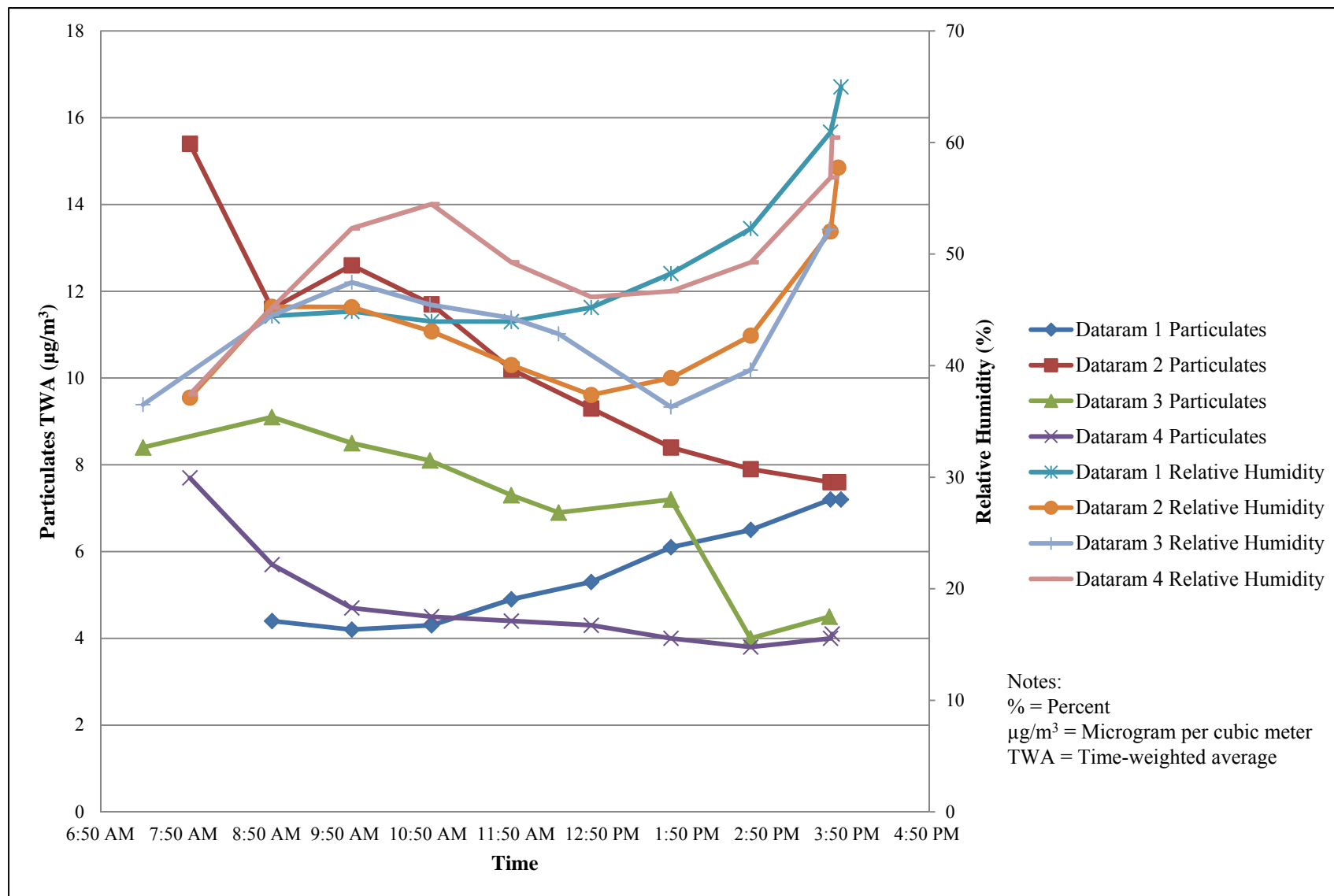


Chart D-4
 Particulate Concentration vs. Relative Humidity – December 6, 2012
 Midwest Generation – Fisk Station Site
 Chicago, Cook County, Illinois.

